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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/098,602	03/15/2002	Andrew P. Kloek	12557-004001	7672

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EXAMINER	
SWOPE, SHERIDAN	
ART UNIT	**PAPER NUMBER**
1652	

DATE MAILED: 01/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/098,602	KLOEK ET AL.	
	Examin r	Art Unit	
	Sheridan L. Swope	1652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) *5-17* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 March 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *0302* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Applicant's election without traverse of Invention I, Claims 1-4, in the response received November 14, 2003 is acknowledged. Claims 5-17 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected Inventions, there being no allowable generic or linking claim. Claims 1-4 are hereby examined on their merits.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Utility

Claims 1-4 are rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility.

The specification asserts that the polypeptide set forth by SEQ ID NO: 2 is a glutamine synthetase-like protein (pg 8, lines 23-25). The specification discloses that SEQ ID NO: 2 has approximately 36% identity with the M. tuberculosis gene (Genbank #F70885), a putative glutamine synthetase (pg 20, lines 22-24 and Fig 2). However, the utility of the protein set forth by SEQ ID NO: 2, as a glutamine synthetase, cannot be deduced from its homology to the M. tuberculosis protein encoded by #F70885 for the following reasons. The M. tuberculosis protein encoded by #F70885 is disclosed only as a probable glutamine synthetase (Cole et al, 1998) and has not been demonstrated to have glutamine synthetase activity. Furthermore, said protein does not comprise all of the conserved active site/catalytic residues, Asp^{50}, Ser^{53}, Asn^{264}, and Glu^{327}, of known glutamine synthetases (Eisenberg et al, 2000; Table II). Therefore, a person of

ordinary skill in the art cannot conclude that the M. tuberculosis protein encoded by #F70885 is a glutamine synthethase.

The protein set forth by SEQ ID NO: 2 also cannot be deduced to be a glutamine synthetase based on homology to proteins of known activity. Sequence searches demonstrated that the best homology for the instant protein, with a polypeptide known to have glutamine synthetase activity, is only a 20.2% query match (see attached alignment) with the glutamine synthethase of the thermophilic eubacterium Thermotoga maritima, (Sanangelatoni et al, 1992). Alignment of SEQ ID NO: 2 with the protein of Sanangelatoni et al further demonstrated that the protein of SEQ ID NO: 2 lacks the conserved active site/catalytic residues, Asp^{50}, Ser^{53}, Tyr^{179}, Asn^{264}, and Glu^{327}, of known glutamine synthetases, as taught by Eisenberg et al, 2000.

Therefore, one cannot deduce a utility for the protein of SEQ ID NO: 2 as a glutamine synthetase based on homology to known glutamine synthetases and conservation of the active site residues. Furthermore, the specification fails to demonstrate a utility for the protein of SEQ ID NO: 2 as a glutamine synthetase based on biochemical analysis of enzymatic activity.

The specification recites the following utilities for the protein of SEQ ID NO: 2. That, (i) "the nematode GS proteins... described herein are novel targets for anti-nematode vaccines, pesticides, and drugs" (pg 15, lines14-15), (ii) "the recombinant GS-like gene product can be used to produce immunologically interactive molecules, such as antibodies" (pg 32, lines 3-4), and (iii) the recited proteins can be used in "a method of identifying a compound capable of altering the activity of GS-like molecules" (pg 34, line 30-31). Each of these utilities is either an application that depends on the protein of SEQ ID NO: 2 being a glutamine synthethase, (i) and (iii), or is an application that would apply to every member of a general class of materials (ii).

Thus, the asserted utility (ii) is not specific, since all proteins can be used to make antibodies. The asserted utilities (i) and (iii) are not substantial, because the use of the protein of SEQ ID NO: 2 as a glutamine synthetase is only potential and is not in currently available in practical form since, said protein has not been demonstrated to be a glutamine synthetase.

Therefore, Claims 1-4 are rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility.

Double Patenting

> The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).
>
> A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).
>
> Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-4 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-4 of copending US application SN10/446,520. An obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but an examined application claim not is patentably distinct from the reference claim(s) because the examined claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985). Although the conflicting claims are not identical, they are not patentably distinct from each other.

Claims 1, 2, and 3 herein recite an isolated polypeptide comprising an amino acid sequence that is at least 85%, 90%, 95%, identical, respectively, to SEQ ID NO: 2, while Claim 4 recites an isolated polypeptide having the amino acid sequence of SEQ ID NO: 2. For SN10/446,520, Claims 1, 2, and 3 recite an isolated polypeptide comprising an amino acid sequence that is at least 85%, 90%, 95%, identical to SEQ ID NO: 3 or 4, respectively, while Claim 4 recites an isolated polypeptide having the amino acid sequence of SEQ ID NO: 3 or 4. Since SEQ ID NO: 3 of SN10/446,520 is identical to SEQ ID NO: 2 herein, Claims 1-4 herein are obvious over Claims 1-4 of SN10/446,520. The claims differ in that Claims 1, 2, and 3 of SN10/446,520 also recite an isolated polypeptide comprising an amino acid sequence that is at least 85%, 90%, 95%, identical to SEQ ID NO: 4, respectively, while Claim 4 therein recites an isolated polypeptide having the amino acid sequence of SEQ ID NO: 4.

The portion of the specification in SN10/446,520 that supports the recited polypeptides includes page 7, lines 14-18, and the sequence listing. Claim 1 herein cannot be considered patentably distinct over Claim 1 of SN10/446,520 when there is a specifically recited embodiment, polypeptides having at least 85% identity with SEQ ID NO: 3, that would anticipate Claim 1 herein. Alternatively, Claim 1 cannot be considered patentably distinct over Claim 1 of SN10/446,520 when there is a specifically disclosed embodiment in SN10/446,520 that supports Claim 1 of that application and falls within the scope of Claim 1 herein, because it would have been obvious to one having ordinary skill in the art to modify the polypeptide of Claim 1 by selecting a specifically disclosed embodiment that supports that claim, i.e., the polypeptide having at least 85% identity with SEQ ID NO: 3 embodiment disclosed in SN10/446,520. One having ordinary skill in the art would have been motivated to do this

because that embodiment is disclosed as being a preferred embodiment within Claim 1. Based on the same reasoning, Claims 2-4 herein cannot be considered patentably distinct over Claims 2-4 of SN10/446,520.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not, in fact, been patented.

Claim Rejections - 35 USC § 112-First Paragraph

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

In this regard, the application disclosure and claims are compared per the factors indicating in the decision re Wands 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988). These factors are considered when determining whether there is sufficient evidence to support a description, that a disclosure does not satisfy the enablement requirement, and whether any necessary experimentation is undue. The factors include but are not limited to: (1) the nature of the invention; (2) the breath of the claims; (3) the predictability or unpredictability of the art; (4) the amount of direction or guidance presented; (5) the presence or absence of working examples; (6) the quantity of experimentation necessary; (7) the relative skill of those skilled in the art. Each factor is here addressed on the basis of comparison of the disclosure, the claims, and the state of the prior art in the assessment of undue experimentation.

Claims 1-4 also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a specific and substantial asserted utility or a well

established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention.

Even if Claims 1-3 were not rejected under 35 U.S.C. 112, first paragraph for the reason presented in the prior paragraph, the following rejection under 35 U.S.C. 112, first paragraph would apply, because the specification does not enable one of skill in the art to make and/or use the recited invention.

Claims 1-3 are rejected under 35 U.S.C. 112, first paragraph, because the specification, does not reasonably provide enablement for any polypeptide having at least 85%, 90%, or 95% identity with SEQ ID NO: 2. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make use the invention commensurate in scope with these claims.

Claims 1, 2, and 3 are so broad as to encompass any polypeptide comprising an amino acid sequence that has at least 85%, 90%, and 95% identity with SEQ ID NO: 2, respectively. The scope of each of these claims is not commensurate with the enablement provided by the disclosure with regard to the extremely large number of polypeptides broadly encompassed by the claims. Since the amino acid sequence of a protein determines its structural and functional properties, predictability of which changes can be tolerated in a protein's amino acid sequence and obtain the desired activity requires a knowledge of and guidance with regard to which amino acids in the protein's sequence, if any, are tolerant of modification and which are conserved (i.e. expectedly intolerant to modification), and detailed knowledge of the ways in which the protein's structure relates to its function. However, in this case the disclosure is limited to the amino acid sequence of SEQ ID NO 2.

While recombinant and mutagenesis techniques are known, it is not routine in the art to screen for multiple substitutions or multiple modifications, as encompassed by the instant claims, and the positions within a protein's sequence where amino acid modifications can be made with a reasonable expectation of success in obtaining the desired activity/utility are limited in any protein and the results of such modifications are unpredictable. In addition, one skilled in the art would expect any tolerance to modification for a given protein to diminish with each further and additional modification, e.g. multiple substitutions.

The specification does not support the broad scope of the Claims 1, 2, and 3 which, encompasses all polypeptides comprising an amino acid sequence that has at least 85%, 90%, and 95% identity, respectively, with SEQ ID NO: 2. The specification does not support the broad scope of Claims 1-3 because the specification does not establish: (A) the biochemical activity or function of polypeptides having at least 85%, 90%, or 95% identity with SEQ ID NO: 2; (B) regions of the protein structure, as set forth by SEQ ID NO: 2, which may be modified without effecting the activity or function; (C) the general tolerance of the activity or function to modification and extent of such tolerance; (D) a rational and predictable scheme for modifying any residues of SEQ ID NO: 2 with an expectation of obtaining the desired biological function; and (E) the specification provides insufficient guidance as to which of the essentially infinite possible choices is likely to be successful.

Thus, applicants have not provided sufficient guidance to enable one of ordinary skill in the art to make and use the claimed invention in a manner reasonably correlated with the scope of the claims broadly including any number of polypeptides with an enormous number of amino acid modifications of the polypeptide of SEQ ID NO: 2. The scope of the claims must bear a

reasonable correlation with the scope of enablement (In re Fisher, 166 USPQ 19 24 (CCPA 1970)). Without sufficient guidance, determination of the identity of sequences having the desired biological characteristics is unpredictable and the experimentation left to those skilled in the art is unnecessarily, and improperly, extensive and undue. See In re Wands 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988).

Claims 1-3 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. These claims are directed to a genus of polypeptides having at least 85%, 90%, or 95% identity, respectively, with SEQ ID NO: 2.

The specification does not contain any disclosure of the function of said polypeptides. The genus of polypeptides that comprise these above polypeptide molecules is a large variable genus with the potentiality of having many different biochemical activities or functions, or no activity or function. Therefore, many functionally unrelated polypeptides are encompassed within the scope of these claims, including partial peptide sequences. The specification discloses only a single species of the claimed genus, the polypeptide of SEQ ID NO: 2, which is insufficient to put one of skill in the art in possession of the attributes and features of all species within the claimed genus. Therefore, one skilled in the art cannot reasonably conclude that the applicant had possession of the claimed invention at the time the instant application was filed.

Applicant is referred to the revised guidelines concerning compliance with the written description requirement of U.S.C. 112, first paragraph, published in the Official Gazette and also available at www.uspto.gov.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sheridan L. Swope whose telephone number is 703-305-1696 (571-272-0943 after January 12, 2004). The examiner can normally be reached on M-F; 9:30-7 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ponnathapura Achutamurthy can be reached on 703-308-3804. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3014 for regular communications and 703-872-9307 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

Sheridan Lee Swope, Ph.D.

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